THE GONORRHEAL PUERPERIUM.[1]

BY

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IN days gone by, severe diseases which had as characteristics high fever and a dulness of the special senses were designated under the general head of typhoid fever; but clinicians have, little by little, separated from the general typhoid state single pathologic processes, such as pneumonia, meningitis, etc., and at the present typhoid fever is a well-defined disease. This result was only attained by carefully recording the different descriptions, and finally a differential diagnosis between the various infectious diseases was made out. Then, with the appearance of the science of bacteriology and with its rapidly perfected technique, endeavor was made to ascertain if each infectious disease had its own special micro-organism, which could be considered as its exclusive factor, and in many cases this result has been attained. Bacteriologists have also done their share in subdividing infectious processes that were formerly thought to be due to a single agent, as, for example, the pneumonia due to streptococci and the pneumonia due to the pneumococcus.

In much the same fashion puerperal sepsis was formerly considered as a single processus, always accompanied with a more or less high degree of temperature. The older gynecologists and obstetricians unfortunately had at their disposal a large number of these cases, with a frightfully high mortality, as compared with the present statistics since the introduction of antiseptic methods. It was not long before surgeons were able to distinguish certain forms of puerperal septicemia, and soon a number of varieties were described. Considering the

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entire course of this affection, a distinction was made between the acute processes which affect the entire organism, and the lighter infections which are limited, at least in the beginning, to the uterus. According to the manner in which extension of the infection took place, either by the blood vessels or the lymphatics, the processes termed septicemia and pyemia were defined, while ulcerative endocarditis and phlegmasia alba dolens were also included in this group. For the localized septic processes names were selected in accordance with the location of the infection and have been designated as puerperal vulvitis, colpitis, endometritis, parametritis, and perimetritis.

Ignaz Semmelweiss, in 1847, was the first to open up the road for the exploration of the etiology of these divisions, which, from the differential diagnostic point of view, are very distinct. Semmelweiss repudiated the theory of cosmic or telluric influences on the origin of septic puerperal processes, and upheld that for any type of puerperal infection decomposed organic matter was the true factor. He, however, admitted two manners of infection—namely, direct infection of the patient by hands or instruments, and, secondly, autoinfection. By autoinfection he inferred that a poisonous material could be elaborated in the puerperal uterus and could spontaneously originate there. As is well known, the teachings of this great man met with much adverse criticism in the beginning, and it was only after Lister had demonstrated the practice of antisepsis that his ideas became generally accepted.

Bacteriological science has done its best to supply bacteriological proofs of these clinical experiments and observations; it has searched in vain for a single specific germ for all diseases of the puerperium, but, with all the great amount of research, it has been uniformly proved that the pus-producing organisms —namely, the streptococcus and the staphylococcus—are the factors of puerperal fever.

When Goldscheider wrote his important paper a few years ago, all severe cases of puerperal septicemia were ascribed solely to the streptococcus, and he admitted that the staphylococcus was in play only when the process was distinctly limited; Winckel sustained this teaching.

The number of bacteria producing the less severe types of puerperal septicemia is far greater, and all authorities who have clinically or bacteriologically studied the factors of puerperal infection now admit a fundamental difference between

infection, the active entering of the bacteria into the living tissue; autointoxication, which is produced if bits of placenta or membrane are retained in the birth canal and there decompose; and the entrance of the toxins of these saprophytes into the general circulation. Spiegelberg was the first to point out the last condition, and Duncan named it sapremia.

The principal characteristic of sapremia is that, when the noxious cause is removed, the process is cut short if done in time. In the localized forms of puerperal sepsis the streptococcus, as well as the staphylococcus, may also be in play as in the more serious infections; and Hartmann, Morax, and many others, including the writer, have been able to demonstrate the presence of the bacterium coli commune in intraperitoneal abscesses arising during the puerperium.

Bumm has pointed out that the streptococcus, as well as the staphylococcus, is only pathogenic facultatively, and this is a well-known character of the bacterium coli. Bumm is of the opinion that the severeness of the infection is in direct relation to the condition of the soil, as well as by the degree of virulence of the pyogenic organism present; and he has asserted that there must necessarily exist a third factor, which is probably a chemical matter, which renders the tissues less resistant to the penetration of the bacteria when once they have gained access, but as yet this chemical substance has not been demonstrated. Besides the question as to when and how pyogenic bacteria become pathogenic in the puerperal state, we have also to consider the question of autoinfection.

It has often been noted that after confinement in which neither manual nor instrumental interference has been employed, the patients have run a temperature, and in order to explain this phenomenon certain writers have again resorted to the theory of autoinfection as emitted by Semmelweiss. Ahlfeld has most emphatically asserted that pyogenic bacteria might be present in the genital organs before labor, and that when this had taken place the result would naturally be a postpartum infection.

When this theory was emitted a very careful and minute technique of disinfection was introduced. "Microbes are all about" was the cry, and in the heat of the struggle against bacteria it was entirely forgotten that a normal labor was a physiological process, whose termination, if left untouched, would in all probability result in the rapid recovery of the pa-

tient. It is certainly very droll when we recollect that only thirty years ago the fanatics on antisepsis went so far as to demand the draining of the puerperal uterus in order to prevent the lochia from becoming infected; but very soon statistics showed that with all this complicated technique no decline in the mortality of labor cases occurred, and consequently at the present time the exaggerated processes of disinfection in normal labor have been practically abandoned.

The technique of cultures has so greatly been perfected in the last few years that the question of autoinfection has been pretty thoroughly studied with the aid of bacteriology. Döderlein, Krönig, Stroganoff, Menge, Winter, and many others have examined the secretions of the genital tract during pregnancy, labor, and the puerperium, from the vulva to the endometrium, but their results are as yet most contradictory on a great many points. The only fact that seems to be pretty clearly established is that from the internal os uteri upward the genital organs are free from bacteria, while micro-organisms are frequently present in the lower parts, a number of them being, however, a certain type of long bacilli producing an acid reaction of the discharges and which are harmless.

The theory of autoinfection, which at present is neither entirely abandoned nor thoroughly believed in, has certainly enriched the etiology of puerperal fever, inasmuch as in certain cases of cryptogenic affections arising during the puerperium it became evident that other influences which are in no way connected with the confinement may be the means of a complication during the puerperium, and that under certain circumstances certain ones of the acute infectious diseases will produce pyrexia during the puerperium; but if a subject is attacked by one of these infectious diseases we cannot correctly say that we are dealing with a puerperal fever, but, more correctly, *a fever during the puerperium.*

One of the earliest infections described as a complication of the puerperium was erysipelas, but it is as yet doubtful whether or not the two types of streptococci, namely, the streptococcus pyogenes aureus and the streptococcus erysipelatis of Fehleisen, are identical. Winckel believes in the identity of the two forms, while Gusserow believes that they are related to each other but differ in their effects. Olshausen was one of the first to call attention to the relationship between scarlet fever and puerperal septicemia. Ballantyne has described a

case of hematoma of the broad ligament produced by scarlatina infection, while Werth found Eberth's bacillus in an abscess of the ovary. The influence of measles on the puerperium has been well described by both Klotz and Ballantyne. The latter has reported a case of premature labor where the patient showed many spots of the characteristic eruption of measles. Bumm has found Löffler's bacilli in the endometrium, while Ripperger has demonstrated that influenza may disturb most seriously the normal course of the puerperium. Massen has conclusively proved that all infectious diseases show their presence in the genital organs of a female in the form of an interstitial hemorrhagic endometritis, and in 1895, in a series of clinical lectures on "Metritis as the Cause of Miscarriage," the writer has fully gone over the ground of this subject.

Of all the acute infectious diseases, it is certainly gonorrhea which plays the most important part in the complications arising during the puerperium. Owing to the fact that the acute stage of this affection is not of long standing in the male, and that gonorrhea seldom extends beyond the posterior urethra, and that the appearance of gonorrheal metastases, generally speaking, is by no means of frequent occurrence, and up to a short time ago gonorrheal infection in the male was considered cured when the subjective symptoms had disappeared, it is not to be wondered at that only a very few years ago the disease, when occurring in the female, was considered as a mild affection localized in the vagina.

It is perfectly natural that Noeggerath, for purely clinical reasons, became convinced that the sexual life of woman could be most fatally interfered with if gonorrheal infection took place, and in the beginning he found but very few believers in the proofs which he adduced to uphold this theory; but at the present time his original writings form the basis of recent researches on chronic gonorrhea of the female. Noeggerath not only emphasized the extremely frequent occurrence of chronic gonorrhea in the male, which he estimated to amount to 80 per cent of the male population in large cities; he asserted that 90 per cent of cases of chronic gonorrhea were never cured, and that the gonococci present without producing symptoms were present in a latent form, as he expressed it, and as such were capable of infecting the female. The consequence was that of 100 women whose husbands had had gonorrhea at some time in their bachelor life, there were scarcely

10 that were well, and one might assume also of that tenth part that at some time or other gonorrhea would be contracted. Basing his assertions on 50 cases, Noeggerath considers perimetritis as the most frequent and the most severe consequence of chronic gonorrhea.

According to its occurrence he divided perimetritis into four types, namely: (*a*) the acute, (*b*) the recurrent, (*c*) the chronic perimetritis, and (*d*) ovaritis. According to this observer perimetritis most frequently arises at about the third week post partum, while the greatest amount of damage inflicted by this process was complete sterility in more than 50 per cent of cases.

Fritsch was the first who undertook to refute some of Noeggerath's assertions, and he chiefly was opposed to the theory of "latency" as put forth by Noeggerath, inasmuch as "an affection of the body is something actual and does not cling like a curse to the organism." Noeggerath's second assertion—namely, that gonorrhea always attacks the entire genital tract—Fritsch tried to refute by citing some of his clinical experiments; in one of his cases, however, in which a perimetritis occurred after miscarriage, the etiological factor of which could only be considered as the gonococcus, the patient recovered after a protracted illness. He nevertheless asserts that gonorrheal perimetritis is far from being as frequent as Noeggerath would have it.

About ten years later Fritsch again disputed the correctness of Noeggerath's theories regarding sterility following gonorrhea. Winckel and Olshausen both stated their conviction that gonorrhea is a much more serious affection than was formerly assumed, but at the same time they insist that the theories regarding sterility are exaggerated, and Winckel expressed himself by saying that if Noeggerath's theory held good to its full extent, mankind would be on the road to destruction. Schröder agrees entirely with Noeggerath in his treatise written in 1887, although at the beginning he was inclined to contradict the former's opinion. He only deviated from his views in the part relating to the frequency of the infection, and Noeggerath himself considerably reduced his percentage later on. The most decided adherent to Noeggerath was Sänger, and in a paper published some years ago this authority stated that one-ninth of all diseases of the female genital organs was due to gonorrhea. Fifty per cent of these patients presented lesions of the

tubes and peritoneum which had resulted from an ascending infection during the puerperium, and from this he concluded that almost all suppurative lesions of the adnexa are chiefly gonorrheal in nature. According to Schwartz the percentage of gynecological cases afflicted with gonorrhea may be put at 12.4 per cent, his diagnosis being partly clinical and partly by smear cultures. He examined 617 females, 112 of whom presented gonorrhea, and, like Sänger, he points out the frequency with which the tubes become involved from an ascending infection, and predicts that in the future many cases of ovarian abscess, pelvic peritonitis, and generalized peritonitis will prove to be due to the gonococcus.

Some time later Sänger made the statement before the first Congress of German Gynecologists that one-eighth of gynecological affections were of a gonorrheal nature; and in order to get a correct idea of how often complications during the puerperium are due to gonorrhea, he examined the gynecological records of the Leipzig clinic and found that 26 per cent of the pregnant women were affected with this pathologic process. In order to corroborate this statement he referred to Oppenheimer, who a year previously had studied the cases in the gynecological clinic of Heidelberg, and who had found that 27 per cent of the pregnant women there admitted were afflicted with gonorrhea and that 40 per cent of the children born in the institution presented a gonorrheal ophthalmia. That this latter affection could never be produced by normal lochia has been demonstrated by Zweifel, who inoculated the conjunctiva with healthy lochial discharges and always with a negative result. Lomer, who at that time was connected with Schröder's clinic, had also made researches for the gonococcus in 32 pregnant women and found the organism present in 9 of them, or, in other words, 28 per cent.

It must be stated that Sänger made his diagnosis from a purely clinical standpoint, as he did not consider bacteriological examinations reliable, and he also pointed out the importance of gonorrheal ophthalmia as a diagnostic point of gonorrhea in women recently confined.

From these figures it at once becomes evident that more than twenty-five per cent of pregnant women are afflicted with gonorrhea, while at the same time the mortality during the puerperium is comparatively small, and Sänger concluded that gonorrheal infection complicating the puerperium can

occur in the two following manners, namely: (1) to an existing gonorrhea there is added a septic infection, which he terms a puerperal-gonorrheal mixed infection; (2) gonorrheal infection which ascends during the puerperium, in which case the disease is due entirely to the gonococcus. This simple infection may have produced an endometritis during pregnancy without having interfered with its progress, and the proof for this assertion he bases on a case reported by Donat, where a miscarriage took place only at the eighth month, although there were numerous small foci of suppuration present in the maternal and fetal choria.

Clinically, Sänger divides puerperal gonorrhea into a process developing *soon after* labor, and, secondly, a process developing at a *later period of the puerperium*, and he gives an example of each. The early infection occurred in a primipara who contracted an acute gonorrhea from her husband nine days after labor had taken place. Three days after coitus she developed a pelviperitonitis, from which she recovered at the end of twenty-two weeks. The example of a late gonorrheal infection was demonstrated in the case of a patient who had given birth to her sixth child; during the third week of the puerperium she developed peritoneal symptoms, which, however, were milder in their manifestations than those met with in a true septic peritonitis. Examination showed a deep laceration of the cervix and a parametritic exudate; the right adnexa had been affected ever since the first labor. On account of the pain present, Sänger removed the diseased structures later on and found that the left tube and ovary were normal, while the right tube had been transformed into a pyosalpinx of fairly good size. This patient's husband was affected with both gonorrhea and stricture. Sänger doubts whether gonorrhea shows itself so early frequently, and thinks that the acute peritoneal stage of the affection usually begins during the second or third week of the puerperium, or even later. In both cases the inflammatory process extended beyond the tubes to the peritoneum; in the case of the early infection a fresh inoculation of the gonococcus was necessary, while when the disease shows itself at a later period Sänger believes that it arises spontaneously from a gonorrheal focus previously present. He states that the extreme tenacity of the gonococcus is very evident from the simple fact that it persists long after the puerperium, although a large number of various organisms

that are present in the genital canal die off, but Neisser's organism persists, in spite of the elimination of the endometrium, without being destroyed or being expelled. When the regenerated mucosa has developed, it will grow more luxuriantly on it than before.

Graefe has recorded another instance of early infection which very closely resembles the example reported by Sänger. A woman who had been infected two days before her labor by her husband, who had an acute gonorrhea, became ill twelve hours after labor with symptoms of severe septic infection. The condition then changed in a most extraordinary manner: the temperature, which had attained 40°, rapidly declined, but the pulse remained small and very rapid; the patient looked as if she had an attack of cholera, but ice and opium produced a rapid recovery. On the second day after birth the child developed a gonorrheal ophthalmia.

As in the case of septic puerperal salpingitis, which may result in fatal peritonitis from a rupture of the tube and escape of pus into the peritoneal cavity, so can gonorrheal peritonitis originate from a previously existing gonorrheal infection of the tubes; and Sänger believes that a certain time is required during which gonorrheal pus can extend from the endometrium into the tubes and from there infect the peritoneum, and that in this manner we can explain the occurrence of a late infection during the puerperium. Sänger agrees with Noeggerath that gonorrheal peritonitis is always limited to the true pelvis and never becomes generalized.

Sänger's views led Kröner to examine the question. He saw the mothers of children that had been treated in the Breslau clinic for ophthalmia, obtained the history of the mothers, and made a local examination. Out of 91 women that he examined, 35 positively stated that they had had fever during their puerperium; but he, however, doubts that the trouble was caused by gonorrhea in all of them, and only admits the diagnosis of gonorrheal infection when the specific organism has been demonstrated to exist in the genital organs. On the other hand, Sänger insists that his method of investigation was much better, and he stated that he had found 35 cases out of 230 cases of gonorrheal infection in which the disease could be traced back to the confinement itself. The return of menstruation and sexual life; the rapid spreading of the process in the regenerated endometrium, which has become more receptive;

the more patent condition of the uterine orifices of the tubes, and subinvolution of the uterus, are all adduced by Sänger for the explanation of the occurrence of tardy gonorrheal infection.

The bacteriological demonstration as to the nature of the gonococcus is based upon the results of the researches of Bumm, which he published in 1895. By using human blood serum as a culture medium, Bumm was able to demonstrate various types of diplococci closely resembling Neisser's organism, both in their appearance and in staining, but which when inoculated he found were not pathogenic for the male urethra, and he termed them pseudogonococci. Neisser's organism is distinguished from the pseudo types by the fact that it actively penetrates into the protoplasm of the leucocytes and is found situated around the nucleus of the cell. By means of a pure culture Bumm was able to produce gonorrhea in a healthy urethra, and was thus able to comply with the third condition of Koch, namely, the proof of the specific action of a micro-organism demonstrated by a successful inoculation of a pure culture.

From examination of sections made from the human eye, Bumm concluded that the gonococcus would neither penetrate the pavement epithelium nor the stratified pavement epithelium and much less the connective tissue, nor did it act as a factor of inflammation, and he concluded that the only surface on which it would grow were the mucous membranes, which are covered with a cylindrical epithelium. It is true that Bumm had been forced to admit that the gonococcus might set up lesions in the pavement epithelium in young people, and consequently one of the principal dogmas of his teaching became practically valueless; but nevertheless, basing his theories on his personal experiments with pure cultures of the organism, he adhered to the idea that suppuration in the connective tissue, or in any other form of epithelium excepting the cylindrical type, could not be produced by the gonococcus alone, but only by a mixed infection with either the streptococcus or the staphylococcus. Bumm and Gerheim consequently upheld that there was no pure gonorrheal colpitis, peritonitis, arthritis, or abscess of the ovary; but, contrary to their assertions, a good many observations have been reported which demonstrate the ease with which the gonococcus may produce an inflammatory process in all types of epithelium as well as the connective tissue.

Touton and Jadassohn demonstrated this fact in the male urethra, while Fritsch showed that the connective tissue of the mucosa of the rectum could be penetrated by the gonococcus up to the muscular fibre. Dinkler proved the same fact in cases of gonorrheal conjunctivitis, while Deutschmann demonstrated the very important fact that a true gonorrheal peritonitis might and did occur; this latter lesion was especially important, because the epithelium of the peritoneum is a very similar structure to that lining the synovial capsules of the joints. Menge and Zweifel pointed out that the frequent occurrence of a former inflammatory process in the peritoneum, arising from a similar lesion in the adnexa, and where the gonococcus could be demonstrated in the pus obtained from the tubes, decidedly diminished the value of Bumm's assertion that the gonococcus could only thrive on a cylindrical epithelium. Zweifel also demonstrated the presence of the gonococcus in the pus of an ovarian abscess, and Sänger has reported similar cases.

Menge emitted the following conclusions from his researches: 1. It has been proved that the gonococcus can penetrate the pavement epithelium. 2. The gonococcus is a true pyogenic organism and can produce peritonitis. 3. The fact that the gonococcus cannot be found in a peritoneal exudate cannot be regarded as a proof that it is not the etiological factor of the process, any more than can the escape of gonorrheal pus into the abdominal cavity without any resulting inflammatory process taking place; for not only would the laparatomy be carried out antiseptically and thus avoid infection, but the pus, having remained for a long time pent up in a pyosalpinx, would have lost its virulence considerably or entirely.

More light was thrown on the bacteriological side of the question, as well as clinical experiments on gonorrhea in the female, by Wertheim, who first obtained cultures of the specific organism by direct inoculation of pus on Petri's plates. He more especially demonstrated that the gonococcus is to be distinguished from other forms of diplococci, from the fact that the organism of Neisser penetrates the protoplasm of the pus corpuscles and is decolorized by Gram's method. The gonococcus can be easily grown by the plate culture method, if human blood serum, to which agar-agar has been added, has been used for a culture medium, and in three days a very good culture of gonococcus will have grown. The pure cultures

obtained by means of the plate method would give rise to a true gonorrhea when inoculated in the urethra. Human blood serum is by far the best culture medium, but a growth of the organism may be obtained on agar-agar, although it will be poor. The colonies on a plate culture have an irregular shape; their color is brownish yellow. In contrast with the staphylococcus the latter have a much more homogeneous form, and the streptococcus which very soon forms chains. Well-developed cultures of the gonococcus may be reinoculated on fresh blood serum in four or five weeks and a new growth will be obtained. The virulence is not rapidly lost by cultures on artificial media, and a colony which had been present six weeks on human blood serum has proved to be perfectly virulent when introduced into the male urethra.

In a pyosalpinx of three months' duration, in which the abdominal ostium had become obliterated, very virulent gonococci were present in a pure culture. In this very interesting case Wertheim was also able to demonstrate gonococci in the submucous connective tissue of the tubes, in the pus of the abscesses of the ovary, as well as in the subserous tissue of the peritoneum and in the fibrinous membrane covering it. From this he concluded that the inflammatory process had spread in the connective tissue of the broad ligament to the ovary, and he also concluded therefrom that an ascending gonorrhea was a uniform process, each one of whose stages could be produced by the gonococcus without any mixed or secondary infection taking place, even in those cases where the lesions were very far advanced. Wertheim coincides with Bumm in the opinion that gonorrheal peritonitis forms a locally limited affection and never produces a generalized peritonitis, as does septic puerperal peritonitis. To study the effect of the gonococcus in the connective tissue, Wertheim followed Bumm's method—namely, to inject subcutaneously on his own person pure cultures of the gonococcus—but, unlike the results obtained by Bumm, he was able to produce an inflammatory reaction of short duration.

In another series of experiments supplementing these results, Wertheim took up the question more especially as to how often pus tubes are due to gonorrhea. Out of 90 cases he found the pus was sterile in 51 instances, while in 49 cases it contained bacteria; in 25 of the 49 cases the gonococcus in pure cultures was obtained from the pus in the tubes—in other words, more than 50 per cent.

Witte spoke very decidedly in favor of the possibility and frequency of a mixed infection as a result of his researches, and, carrying these on, he found gonococci present 4 times out of 24 positive cases, once in a pure culture and 3 times in combination with other bacteria. In 52 cases of pus tubes examined by Prochownik 26 presented the evidence of the presence of bacteria, while the gonococcus was only obtained in 2 specimens, once in a pure culture and once combined with the streptococcus.

Whether or not Wertheim was right as to his percentage of cases in which the gonococcus can be demonstrated, he is at any rate the first who showed its presence in the female genital tract by staining the secretions and cultivating it, and he has pointed out the immense part played by this organism as a factor of pyosalpinx and circumscribed peritonitis without the aid of other pyogenic bacteria. His inoculations also permanently refuted the old belief that an infection with chronic gonorrhea could only produce a chronic gonorrhea, because he was able to obtain from long-standing discharges very virulent cultures, which, when inoculated on a healthy urethra, would give rise to an acute process; and this also definitely settled the question of Noeggerath's latent gonorrhea, which is nothing else but a latent lesion containing virulent gonococci. All this also went far in demonstrating the true pathology of puerperal gonorrhea.

Oppenheim was fully aware that the specific organism could be found in very large numbers in the lochia of females affected with gonorrhea, and that this liquid was a very excellent culture medium. Sänger and Lomer came to the same conclusion, while Bumm found large quantities of gonococci in the lochia from the second to the fifth day and after, either contained within the leucocytes or in clusters between them. The gonococci found were very large, which caused Bumm to believe that the puerperal process was extremely favorable for the development and growth of Neisser's organism. At this period the lochia contained hardly any other organism; in fact any other types were entirely lacking. The process and evolution of the lochial secretion varies, but not infrequently the secretion stops about the end of the third week of the puerperium and is only present in the form of a slight mucous discharge, and it is just at this period that the presence of the gonococcus is difficult to demonstrate.

Von Steinbüchel undertook a series of experiments at Chro-

bak's clinic in order to examine the views of Noeggerath and Sänger. He, in the first place, ascertained the number of pregnant women who were suffering from gonorrhea by carefully going into the history of the cases and by bacteriologically confirming his examinations, and at the same time he made the same observation that Bumm had made previously, namely, that the secretion of pregnant women suffering from gonorrhea did not differ microscopically from that of other pregnant women, either in quantity or quality. He examined 318 women, 70 of whom were affected with gonorrhea—in other words, 21 per cent. Bacteriologically, proof of the presence of gonorrhea was only absolutely positive in 22 out of the 70 cases. As a clinical proof of the presence of this affection, Von Steinbüchel points out that condylomata, cervical catarrh without erosions, and granular colpitis are symptomatic; Sänger's assertion that these three affections are pathognomonic has long since been disproved. It is a well-known fact that condylomata acuminata may also be due to other causes, as for example a considerable moisture of the parts, and it is of frequent occurrence to meet with a granular colpitis in women who are not pregnant. As far as cervical endometritis is concerned, it may simply be said that pus from a gonorrheal process will destroy the mucosa of the cervix just like any other form of pus. If we consider these sources of possible error, the statistics offered by Von Steinbüchel must be considered as representing too great a per cent, but nevertheless the number of pregnant women affected with gonorrhea is still extremely high. He considers with Fehling that a normal puerperium is one in which during the first week the temperature does not rise above 38° C.

Out of 68 cases of gonorrhea (excluding accidental causes, such as tuberculosis, erysipelas, pneumonia, constipation, etc.), 7 presented fever in the early part of the puerperium, in 4 it was present for more than one day, while in 3 it was only present twenty-four hours. Out of 242 patients who had been delivered and who were free from gonorrhea, 21 had a rise of temperature without any accidental cause being present. Comparing the 9.3 per cent of gonorrheal fever with the 9 per cent of puerperal fever due to other sources, the above-mentioned author believes that he is entitled to conclude that the influence of gonorrheal infection on the early stages of the puerperium is practically *nil;* but, on the other hand, he con-

firms the opinion of Sänger and Bumm, namely, that in the late stages of the puerperium gonorrheal symptoms are very frequent. He ascertained the ultimate condition of 8 pregnant women who presented gonorrhea before their confinement, and found that 6 of them were taken ill, from two to three months after their labor, with perimetritis. One of the patients presented the first attack of peritonitis as early as the twelfth day post partum; she was a prostitute in whom an abortion had taken place during the fourth month of gestation, and during the puerperium large numbers of gonococci were present in the secretion from the urethra. but there were very few present in the lochia. The patient was dismissed on the eighth day. Twelve days after the confinement, presumably on account of too much effort in walking, she was taken with intense pain in both hypogastric regions, fever and pain in the abdomen when pressure was used. The diagnosis at that time was peritonitis, and after remaining in bed a fortnight she recovered and since has remained perfectly well. Examination five months after labor revealed nothing abnormal in the right adnexa other than a few perimetritic adhesions extending to the pelvic wall and which bound down the tube and ovary quite firmly. The left tube had grown adherent to the ovary and was embedded in a mass of perimetritic exudate, so that they formed an immovable tumor the size of a large walnut. Von Steinbüchel concludes that the late appearance of gonorrhea during the puerperium may be attributed to the distance which the gonococcus must travel to reach from the internal os to the uterine opening of the tube, and also to the fact that the lochia have a tendency to wash away the organisms, thus rendering their ascension difficult; but when the lochia decrease in amount this source of hindrance to reaching the tube is done away with.

The conclusions of Von Steinbüchel are contradicted by Krönig as far as they concern the early part of the puerperium. This latter observer was able to find the gonoccocus in 9 women who had been delivered and who were suspected of having gonorrhea, the lochia having been obtained from the uterus by means of sterilized glass tubes. It is only by this method that it is possible to obtain lochia from the upper genital tract that have not become mixed with the secretion from the lower part of the tract. Krönig made cultures according to Wertheim's technique and was able to obtain pure cultures of the gonoccocus, and he also demonstrated their frequent occur-

rence in the lochia, which microscopically showed that almost every cell contained the organism. Only 1 of these 9 patients was free from fever, while all the others showed an elevation in the temperature varying between 38.5° C. and 40° C. In all these cases the fever subsided without any treatment, and there was no other etiological factor to account for the elevation of the temperature, and two of the patients had been delivered without a single digital examination. In all of these cases the lochia were greatly increased, but did not have any odor. In six of the patients the temperature remained normal after the end of the first week, but the lochia, nevertheless, continued very profuse. In two instances the symptoms continued into the latter part of the puerperium; one patient presented a pelviperitonitic exudate in the third week, while the other developed a parametritic exudate the size of a hen's egg, which was complicated by a tenosynovitis of the right hand. The pus obtained from the sheath of the tendons gave a negative bacteriological result.

Krönig concludes that gonorrheal endometritis is in itself quite sufficient to produce a rise in temperature during the early part of the puerperium, and that later on the gonorrheal process may extend upward and produce perimetritic lesions. Whether or not the parametritis occurring in the latter part of the puerperium is due to a secondary infection he is unable to say, but he inclines to the opinion that it is not.

In the discussion following the reading of this paper, Schmorl upheld that cases of infection occurring during the latter part of the puerperium are due to a secondary infection from the streptococcus or the staphylococcus, and he cited three cases of a generalized pyemia following acute gonorrhea, and in all three the pus obtained from the metastases contained only the streptococcus. Sänger and Döderlein are also in favor of a mixed infection with pyogenic bacteria in those cases where pyemic symptoms arise after the presence of gonorrhea has been ascertained.

Another case of a rise in temperature during the early part of the puerperium is reported by Von Franqué; the temperature rose on the third day and lasted for three days. Microscopically, gonococci were found in the secretions, and also some short rods which could not be grown on any media. The child of this patient presented a gonorrheal ophthalmia on the fifth day. Out of 32 cases of pregnant women who presented a

pathological condition of the vaginal secretions, Burkhardt was able to demonstrate the presence of the gonococci in 19. Leopold relates as similar cases two instances of infection during the early part of the puerperium where the rise in temperature took place on the fourth day. The first case was that of a primipara, 16 years of age, who had a rise in temperature for three days. On the seventh day post partum a greenish-gray membrane was found covering the vaginal walls and the cervix, which was slightly lacerated. This membrane was examined microscopically, with the result that the gonococcus was found in a pure state. The patient was completely cured at the end of eight days. The second case was that of a female who had given birth to her fourth child and who was admitted to the hospital with a very severe cold. The child presented a gonorrheal ophthalmia two days after birth. On the fourth day of the puerperium the patient became feverish and a greenish-gray exudate was found covering the vagina and cervix. Bacteriological examination of this exudate demonstrated the presence of the gonococcus, staphylococcus, and streptococcus. In this patient the fever remained somewhat longer than in the first case, and the lochia were still in rather large quantities fourteen days after the patient was discharged from the hospital. Concerning this latter case Leopold is of the opinion that the fever was due to a secondary infection of the gonorrheal process from the streptococcus, and as the patient during her confinement had only been examined externally this would seem to be a fair example of autoinfection.

Krönig was able to demonstrate the presence of the gonococcus in 6 out of 11 patients having a pathologic secretion from the vagina, and 1 of the patients was taken with symptoms of endometritis as early as the second day post partum. Veit in his writings only alludes to the influence of very recent gonorrheal infection on the process of generation. He relates 5 cases which resemble one another, inasmuch as the infection was caused by an acute gonorrhea in the husband, the wife being infected just before or shortly after labor. In 4 cases the children presented a gonorrheal ophthalmia, and all 5 of the patients presented symptoms of acute peritonitis at about the end of the early part of the puerperium, the peritonitis combining all the classical characteristics of an acute septic type of the disease—namely, severe tympanites and vomiting, small and frequent pulse, a temperature above 39° C., and intense abdominal pain. The appearance at a later period he

considers as one of the most important differential symptoms of gonorrheal peritonitis. In all of his cases the violent symptoms diminished and the patients recovered slowly.

According to Veit the rapid ascension of the affection is due to the relaxed condition of the genital tract shortly before and during the puerperium. In all publications which have appeared, it seems to indicate that the gonorrheal infection, whose presence has been proved by the demonstrations of the specific organism in the lochia, can produce lesions either during the early or the late stage of the puerperium. A definite time cannot be fixed regarding the power of the gonococcus of producing an endometritis of a lighter grade during the early part of the puerperium, and Krönig reports cases in which the gonorrheal fever appeared as early as the second day post partum, and in his case, as well as the one reported by Von Franqué, there is nothing in the history that would tend to show that an impure coitus had taken place shortly before or after labor. The process in these cases is to be explained as the upward extension into the endometrium of a pre-existing gonorrheal infection, the process in the endometrium being accompanied by pyrexia of short duration.

In contrast to what has been said we have the reports of Sänger and Veit, which have in common the fact that shortly before or after birth an infection, with a more or less acute gonorrhea, is the factor of the affection; just how far the part played by the virus of the gonococcus is concerned cannot be definitely ascertained. Wertheim believes that in all cases a gonorrheal process is capable of producing acute manifestations in the subject infected. The symptoms of such forms of the disease probably arise somewhat later—that is to say, only toward the end of the early part of the puerperium—but they then cause very severe peritoneal symptoms, because the gonorrheal process has extended beyond the uterine end of the tube. In contrast to septic puerperal peritonitis, the fever, as well as the severity of the symptoms, soon decreases and the patient recovers in the gonorrheal type. In both forms, which are consequently different from each other, gonorrheal infection extended beyond the internal os before it influenced the temperature. It is difficult to say how the gonococcus could extend upward during the first few days when the lochia are excreted in such large quantities.

When the endometritis is followed by a parametritis with

metastases into the tendinum vaginæ, Krönig does not admit that these secondary complications are due to an infection by the streptococcus, and he consequently entirely agrees with Wertheim that the gonococcus does not merely produce a localized infectious process in the endometrium, but that it also penetrates deeply into the connective tissue and can then produce a suppurative process. He thinks that the other cases of parametritis may be explained in a similar way if it be admitted that the gonococcus finds its way into the subperitoneal connective tissue through a laceration in the cervix. Continuing this line of thought, it might also be assumed that a pyosalpinx could be produced by an invasion of the gonococcus, having its starting point in the subserous membrane of the tubes and extending through their walls into their lumen, and that, therefore, the endometrium may not be the seat of any gonorrheal infection during the formation of a pus tube. This theory has generally been admitted as correct since Wertheim's first writings.

Wertheim's conclusions have, however, been considerably modified by Bumm, who admits that the gonococcus grows on all types of epithelium, and this organism is quite capable of producing either a vaginitis or a peritonitis. Gonococci have also been found in the connective tissue, but Bumm has only found them in the superficial subepithelial strata, and in the various glands connected with the genital apparatus he was only able to find them in the ducts and never in the deeper secreting portions. This result is quite sufficient to explain the pathology of gonorrheal metastases. Wertheim has demonstrated in a case of gonorrheal cystitis a capillary vessel in the superficial submucous tissue in close proximity to the mucous membrane of the bladder, that was completely filled with gonococci.

The first attempt at inoculating pure cultures of the gonococcus into the connective tissue of the arm gave a negative result, but, as has been stated, Wertheim obtained inflammatory symptoms by these inoculations, while Bumm, carrying on this line of experiments, obtained only negative results; Steinschneider and Richter also obtained negative results.

Wertheim's statement, which is most important from a clinical standpoint, that he had seen the gonococcus produce oöphoritis, salpingitis, and peritonitis after it had passed through the connective tissue of the broad ligament, just as

occurs in the case of the ordinary pyogenic bacteria, is absolutely denied by Bumm, and he declares that this statement is not supported by the results of any other bacteriologists, including Charrier. On the contrary, Bumm assumes that in this case a pyosalpinx was present and that the process had extended into the parametrium, and he declares that it is absolutely wrong to uphold that Neisser's organism can produce suppurative processes in the deep connective tissue. He asserts that gonorrheal parametritis is due to a mixed infection; and in a mixed infection with the gonococcus he distinguishes two types—namely, a secondary infection from the staphylococcus or the streptococcus developing after the first manifestations of a purely gonorrheal process; and, secondly, a symbiosis where both kinds of bacteria act at the same time. On the other hand, he admits with Wertheim that a pyosalpinx very frequently has a purely gonorrheal origin, and that the infection may in most cases be traced back to the latter part of the puerperium; and he says that the division of pyosalpinx into a septic puerperal form and a gonorrheal form is no longer sufficient, and it is also necessary to admit a gonorrheal puerperal origin.

In the case of a pyosalpinx which has produced a closing of the abdominal ostium of the tube, an acute or a recurrent perimetritis may be explained, because not only can the encapsulated pus, which is a foreign body, produce irritative symptoms, but, owing to sudden or forced movements, a thin adhesion may be ruptured and allow the pus to escape directly into the peritoneal cavity, after which the rent in the adhesion may become closed. The gonococcus can only set up a suppurative inflammation of the ovary if the pus becomes inoculated on a ruptured Graafian follicle. Bumm also upholds that this form of peritonitis never becomes generalized and never is fatal, and according to him the favorable outcome of these cases is due to the fact that the gonococcus does not find a suitable culture medium on the peritoneum and consequently leads a short life. The limitation of the peritoneal inflammation is due to the fact that the fibrinous agglutination walls off the process and prevents the extension of the gonococcus to the rest of the abdomen. The material which forms the fibrinous substance, which is termed fibrigenous matter, is contained in the inflammatory exudate, and the fibroplastic substance with its ferment is abundantly supplied by the leucocytes.

Now, while the staphylococcus and the streptococcus do not

actively enter within the leucocytes, the gonococcus, contrary to the teachings of Metschnikoff, is able to do so very considerably, and consequently is able to liberate the fibrin ferment. It is for this reason that numerous adhesions are found in gonorrheal peritonitis and are thrown out with extreme rapidity, while in septic peritonitis due to ordinary pyogenic organisms an abundant exudate is found covering all the viscera.

It may consequently be said that a gonorrheal process may extend upward from the internal os and invade the entire genital tract. Regarding the symptoms, all authorities appear to agree that their course is in every case much milder than in the ordinary septic infection, and the highest degree of a gonorrheal process is represented in a circumscribed peritonitis.

From a careful perusal of a large amount of literature published on the subject in French, German, and English, one thing stands out plainly, and that is that no definite symptomatology or manifestation of a gonorrheal process during the puerperium can be described. Gonorrhea does not appear to produce an elevation of the temperature if the process does not extend above the internal os; and Schauta even goes so far as to assert that a gonorrheal catarrh of the cervix may extend to the endometrium without giving rise to any serious symptoms, and Fritsch's paper, which I have already mentioned, certainly points to the correctness of this assertion. In some of the cases recorded in this memoir an endometritis went through its evolution without any elevation of temperature, and an extension of the process from the uterine mucosa to the peritoneum took place insensibly. If a rise in temperature should occur in a case of a pure gonorrheal endometritis, Leopold upholds that it may take place as early as the third day of the puerperium, and therefore we can no longer maintain that a rise of temperature occurring late in the puerperium is a special characteristic of a gonorrheal infection. The acuteness of the progress of the affection in the early puerperium—that is to say, the duration of fever during a gonorrheal endometritis, with or without extension of the process to the tubes or the peritoneum—will in all probability depend upon the virulence of the gonococcus, whether there be a mixed infection or not.

If a newly-married girl infected with an acute gonorrhea from her husband can show a bilateral pyosalpinx at the end of a week—and such cases are of daily occurrence—there is no doubt that a similar process can develop with the same rapidity during the puerperium. Gonorrheal processes occurring late

in the puerperium may also be traced to various causes which certainly have a preponderant influence upon the degree and duration of the process. Veit and Winter ascribe the upward extension of the infection to the uterus, tubes, and peritoneum, to the relaxation of the genital organs, or to the return of the menstrual process. Wertheim has expressed a view to the effect that in married people a certain adaptation to the gonococcus takes place, but when sexual intercourse is interrupted the immunity to the organism ceases, and the effect of coitus, when resumed, is a fresh infection.

As far as we can ascertain, all authorities agree that gonorrheal infection during the puerperium runs a milder course than other septic processes arising during the lying-in period. The milder course of the symptoms and their rapid subsidence in puerperal gonorrhea by no means indicate that the process has been cured, and it is a well-established fact that the gonorrheal puerperium is extremely chronic and defies treatment, just as is the case with gonorrheal processes in the female in general. This is especially true of recurrent perimetritis as described by Noeggerath. When the process has involved the adnexa the patient is subject to most severe suffering, and a cure can only be brought about by the removal of the appendages; and in those cases in which the affection is allowed to go on unaided by surgical interference the patient usually succumbs to a gonorrheal cachexia.

As has already been pointed out, the presence of the gonococcus can usually be demonstrated by an examination of the lochia. The organism produces such varied manifestations in all periods of the puerperium that purely clinical symptoms are not sufficient upon which to base a diagnosis, and it is of absolute necessity to examine the secretions bacteriologically in all cases where gonorrhea is suspected. The tendency of a gonorrheal process to extend upward during the puerperium, and also its persistency to take a chronic course, demonstrate that this disease has a decided influence on fecundation as well as on pregnancy. Acute gonorrhea in the female is in most cases largely limited to the cervix and urethra, and it would seem probable that an acute gonorrheal inflammation of the cervical canal would prevent the male elements from reaching the ovum either within the uterine cavity or in the tube.

On the other hand, a chronic gonorrheal process of the cervix should not interfere with the entrance of the spermatozoa

within the uterine cavity, because the cervical secretions are very scant. If the entire extent of cylindrical epithelium of the endometrium be invaded extensively by the gonococcus, the possibility of an impregnated ovum becoming attached to the uterine mucosa is very improbable. When the endometritis has assumed a chronic form, in which case the cylindrical epithelium of the endometrium has become regenerated so that only in a few spots pavement epithelium invaded by the gonococcus has remained, pregnancy can take place and go to term, or at least to the seventh or eighth month. If, on the other hand, a gonorrheal endometritis be followed by a metritis, with hypertrophy of the connective tissue and an abnormal development of the uterine glands at the expense of the muscular structure of the uterus, the insufficient elasticity of the uterus will mechanically act against the development of the organ when pregnancy takes place, and the result will naturally be an early miscarriage. This applies to the process whether it originates in the parenchyma of the uterus itself or whether it is due to the gonococcus present in the submucosa.

The most common condition met with is probably that conception and gonorrheal infection are simultaneous or take place shortly after one another, so that the development of the ovum will prevent the upward extension of the gonococcus, and it is only after labor has taken place that the uterine cavity becomes infected.

A pyosalpinx, if present in only one tube, will not interfere with pregnancy, because ovulation will take place on the opposite side and the ovum can reach the uterus through the healthy tube, and this condition is certainly frequently met with in practice. Bilateral pyosalpinx will render the female sterile, but even in cases where both tubes are patent a perimetritis with adhesions will prevent the entrance of the spermatozoa into the uterine cavity, because the uterus is bound down and its position changed in the vast majority of cases. In our opinion, and the same has been upheld by Bumm, the chronic gonorrheal endometritis and salpingitis is an important etiological factor of tubal pregnancy.

The social danger of gonorrhea is its tendency to cause sterility, and Sänger has very ably demonstrated the frequency of what he terms a "one-child sterility" as a consequence of gonorrheal infection. The first pregnancy goes to term, and during or after the puerperium the process extends upward,

producing chronic pathological changes from the internal os upward, and the female thereby loses her aptness of conceiving and carrying her pregnancy to term.

On the other hand, every sterile union must not be attributed to the wife, and out of 205 sterile marriages Fürbringer found that 35 per cent were due to a former gonorrhea in the husband. According to the statistics made in France by Chervin, out of every 100 marriages 20 were absolutely sterile and 24 gave birth to only one child. Glünder, basing his researches on the history and partly on clinical examinations, comes to the result that in 84 sterile marriages gonorrheal infection was present 62 times, or, in other words, 77.5 per cent. If on the average 12 per cent of all marriages are sterile, 8 per cent of them must be ascribed to gonorrhea; and it seems thus proved that gonorrhea may not only interrupt pregnancy after it has taken place, but may prevent it from occurring altogether.

It is very true that a large percentage of females recover from gonorrheal infection without the slightest trace of the disease remaining, become pregnant and go to term, give life to children who soon after birth develop a gonorrheal ophthalmia, go through their puerperium and lactation without any trouble; while others, from the very receipt of the infection, remain sufferers for the rest of their lives, being attacked by recurrent attacks of pelviperitonitis, have abnormal labors, and often die in consequence of their diseased genital organs.

At the present time an explanation of the above statement cannot be made with certainty, but it would appear to the writer that some inherent weakness of the epithelium, as has been pointed out by Bumm, may account for those cases where the process remains. An infantile development of the female and her genital organs should also be considered as an excellent soil for the development of the gonococcus, as has been pointed out by Freund, and reddish blonde and light blonde females are certainly more severely affected by gonorrheal infection than are darker-complexioned subjects, and here the diathesis of the individual certainly acts as a *locus minoris resistentiæ.*

We will here append five cases of gonorrheal puerperium which we have seen; and although this number could probably be greatly increased, we only report these particular cases because in each instance they were demonstrated bacteriologically to be examples of the disease.

Case I.—Mrs. A. B., age 24 years, was confined of her first

child on April 21, 1895. The labor was comparatively easy and the child was an eight-pound girl. The antecedents of the patient were briefly as follows: She had always menstruated regularly without pain, the flow lasting usually five days. She was married at the age of 21. Three months after marriage the patient noticed a slight glairy discharge from the vagina, which never amounted to much of anything, excepting that it was somewhat increased during the three or four days preceding and following the menstrual epoch.

Five days after confinement the thermometer suddenly rose to 39° C., pulse 98; there were no chills. The patient also complained of considerable pain in the sacral region and also in the left side. The lochia, which had been normal in amount up to this time, decreased somewhat.

Bimanual examination revealed a small left-sided laceration of the cervix; the uterus was the size of a fetal head, soft and tender on pressure. On the left side could be felt a mass the size of a lemon, which was extremely painful and hard. Nothing could be detected in Douglas' pouch, which was perfectly free. The right adnexa were apparently normal. By the speculum a few erosions were detected on the cervix, which bled rather easily when their surface was wiped over with cotton. There were no apparent lesions of the external genitals, and the urethra seemed to be perfectly normal. An analysis of the urine was also negative. A long platinum loop was introduced into the uterine cavity, and some of the secretion was removed for bacteriological examination; cover-glass preparations, stained with methylene violet, revealed large numbers of gonococci both between and inside of the epithelial cells. A diagnosis of puerperal gonorrheal endometritis and salpingitis was made. The treatment consisted of intrauterine irrigations twice daily of a 1 : 3000 solution of permanganate of potassium and application of equal parts of mercurial and belladonna ointment to the abdomen.

The temperature fell to normal just one week after commencing this treatment, which was carried out for about four weeks, at the end of which time a bimanual examination showed that perfect involution of the uterus had taken place and that the salpingitis had almost entirely disappeared. Microscopical examination of the secretion from the cervix, taken three weeks after all treatment had been stopped, was entirely negative.

The child never presented any signs of inflammation of the

eyes. The husband admitted that he had been a sufferer from gleet for the past nine years, his last attack of gonorrhea having taken place nearly seven years before marriage.

Case II.—Mrs. A. C., age 31 years, seen in consultation with Dr. S. H. Littlefield. The patient had given birth to two healthy children, who were both alive and in excellent health. Seventeen days after the delivery of her third child, the labor being in every way normal, the patient complained of chills in the afternoon, and in the evening the temperature was found to be 38.7° C., pulse 102, and we were asked to see the patient. She was a well-developed brunette with a negative history. Examination of the thorax was negative. A few enlarged inguinal glands could be detected on the right side. External genitals, urethra, and Bartholin's glands were normal. Bimanual examination revealed her uterus about the size of a second month's pregnancy, which was soft and rather tender on pressure. There were a few erosions on the cervix, and a very little muco-purulent discharge came from the os. A platinum needle was introduced into the cervical canal and some of the secretion was removed for examination; a cover-glass preparation stained with methylene blue revealed numerous leucocytes containing gonococci, with clusters of the organism between them, and a few epithelial cells were found. The adnexa appeared normal and were not tender on pressure.

A diagnosis of gonorrheal endometritis in the puerperium was made. After complete dilatation of the cervix the uterine cavity was very carefully curetted and then swabbed out with pure carbolic acid. The fever immediately fell, and in three weeks from the time of operation the patient was up and attending to her household duties. The child never gave evidences of any complication in the eyes. The husband had contracted an acute gonorrhea about a fortnight before the birth of the child; coitus had taken place about ten days after the confinement.

Case III.—Mrs. A. D., age 35 years, was confined of her fourth child by Dr. Rideout, of Somerville, who kindly asked me to see the case in consultation. The genital history of this patient was absolutely negative, and the previous confinements had all been normal. Five days following the confinement the patient had some slight chills, and pains in the calf of the right leg The limb began to swell rapidly, and within twenty-four hours presented all the ordinary signs of a phlegmasia alba dolens. Two days after this the right leg became painful and

rapidly developed into the same condition as its fellow. The patient complained of a great deal of tenderness throughout the lower abdomen. We saw the patient on the eighth day after the confinement, and, on account of the condition of the lower limbs, a vaginal examination was difficult to obtain. Palpation of the abdomen revealed a mass extending across the pelvis into both iliac fossæ and upward to about 15 centimetres above the pubis.

The doctor informed us that the child's eyes were very much inflamed on the second day, but by a rigid treatment with nitrate of silver they were improving. The usual treatment of phlegmasia alba dolens was ordered.

Three days later we were asked to see the patient again, and found that the abdominal pain was becoming more severe and that the temperature was rapidly rising and on this day had reached 40° C. Ether was given, and the vagina was spread open by two vaginal retractors with much difficulty on account of the condition of the legs. There was a considerable bulging in Douglas' pouch, and bimanual examination revealed a large, diffuse, fluctuating mass behind and on the sides of the uterus. Posterior vaginal colpotomy was done, which gave issue to about 500 cubic centimetres of a thick, yellow-greenish pus which microscopically revealed a considerable number of gonococci both within and between the leucocytes.

To be brief, we will simply say that after five weeks the temperature slowly reached the normal and the phlegmasia alba dolens subsided. Bimanual examination at this time showed that the uterus was somewhat enlarged and in retroversion, bound down and surrounded by a dense mass of adhesions. About nine months later we were obliged to perform a total abdominal hysterectomy on account of the very severe pain and rectal symptoms presented by the patient.

At the time of writing fifteen months have elapsed since the hysterectomy, and the patient is in very fair health.

Case IV.—Mrs. A. E., age 30 years, was seen in consultation with Dr. Ryan four weeks after having been confined of her second child. The antecedents of the patient, both as to her genital organs and general health, were rather obscure, although there apparently had been no symptoms of gonorrhea. The labor had been normal.

The patient was a slightly built blonde presenting a decidedly lymphatic diathesis. She complained of some pain in the lower abdomen, and for the last two days the right knee-joint

had become swollen and painful, and it was for this latter condition that our opinion was asked. Suspecting the true nature of the trouble, a bimanual examination was asked for, which revealed an enlarged and flabby uterus and considerable thickening in the parametrium. Much pain was produced by the examination. Some of the secretion coming from the cervix was removed and showed microscopically a few clusters of gonococci, which were scattered throughout the preparation.

The right knee-joint was considerably enlarged. The local temperature was elevated and the joint was extremely tender, and fluctuation could be elicited. The diagnosis of gonorrheal endometritis and parametritis in puerperio, with metastasis into the right knee-joint, was made. Irrigations of 1 : 3000 solution of permanganate of potassium were ordered to be given twice daily, and the knee was fixed on a posterior splint and a thirty per cent ichthyol ointment was ordered to be freely applied to the joint once daily. Internally fifteen drops of the oil of wintergreen were given four times a day.

The general condition improved under this treatment, and the temperature, which on the day the patient was first seen by the writer was 39.2° C., fell at the end of a week to normal. By the use of the intrauterine irrigations the genital organs were greatly improved, so that eight months after the confinement, when the patient was last seen, a general thickening of the parametrium and a retroverted uterus was all that remained ; and except for the rectal symptoms produced by this condition of affairs, as well as some pain at the time of menstruation, the patient was feeling fairly well. The knee-joint was somewhat stiff and presented a certain amount of thickening around the joint, but fairly good movements could be obtained, and the patient was able to walk without much trouble.

The patient's husband was a travelling man, and during his absence from town his wife had sexual relations with a cousin about three weeks before delivery took place.

Case V.—Mrs. A. F., age 27 years, was delivered of her first child on February 17, 1897. Two weeks after her confinement the patient felt chilly and the temperature suddenly rose to 39° C. The labor had been a tedious one, but instrumental interference had not been necessary. As we only saw this patient once in consultation, we unfortunately do not know the ultimate outcome, but the following local conditions were found. The vagina was lined by a thin, greenish-yellow mem-

brane, which extended up on to the posterior lip of the cervix. The urethra and Bartholin's glands were normal. There were no enlarged glands in the inguinal region. Bimanual examination revealed a somewhat enlarged and tender uterus, with a mass about the size of a walnut on the right side. Examination of the secretion coming from the uterus, as well as of the false membrane lining the vagina, revealed gonococci in considerable numbers. A diagnosis of gonorrheal endometritis, right-sided salpingitis, and vaginitis in puerperio was made, and intrauterine and vaginal irrigations of permanganate of potassium were advised.

The husband admitted that he was suffering from a subacute gonorrhea, which he had contracted about four months before the birth of the child, and that coitus had only taken place on one occasion about six weeks before the confinement.

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